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Since psychology has been taken out of the field of metaphysics, and has entered the domain of the natural sciences, it has developed marvellously. The accuracy and stability it has attained are proportionate to its development. Biology has brought about this change. The former position psychology occupied was not so much to determine the relation and connection between mind and organism as to determine the science of pure thought. But now psychologists have studied the brain, anatomists have dissected the cerebral lobes, chemists have analyzed the different substances of the nerves and brain, and its size, weight, shape, and specific gravity have been taken into account for the sole purpose of determining psychical phenomena; also the laws of development have been applied to the phenomena of the human mind. The study of animal instinct, the growth of children, the customs, habits, and beliefs of early tribes and races, the study of defectives, the study of the brain and the senses and the logical connections of ideas, have all received their share of attention. There is no psychical phenomenon and no act of human conduct which does not come within the province of psychology. The sciences of ethics, of theology, of law, of jurisprudence, of history, of medicine, of pedagogy, and of politics presume a knowledge of the workings of the human mind. For who, unless competent to analyze correctly and justly the feelings, desires, and motives that prompt action, would desire to determine the motives that underlie human conduct or pass upon the laws of right and wrong. How much more humane would a person be in his judgment upon the acts and conduct of another if he knew the causes of them. How many mistakes would be avoided in the training and education of the young, if parents and teachers were more conversant with the principles of psychology. How much more accurate could judges be in dispensing justice, if they were less dependent upon their personal experience, and knew more about the principles of psychology. What material aid could lawyers give in establishing the truth, if they were well versed in the study of psychology. How many grave blunders could be avoided, if statesmen and legislators understood more thoroughly the spirit of the times and the popular mind.

That the larger portion of professional men know little, if anything, about psychology cannot be denied, and if they do know something about the study, their knowledge is either founded on their personal experience and on common maxims, or it is derived from some book written from some particular standpoint. Most of such knowledge is incorrect and wrong, and it is one of the objects of psychology to correct these false notions.

In conclusion, I will quote John Stuart Mill, who has given an excellent statement of the reasons why psychology should be studied. He says: "Psychology, in truth, is simply the knowledge of the laws of human nature. If there is anything that deserves to be studied by man, it is his own nature and that of his fellow-men; and if it is worth studying at all, it is worth studying scientifically so as to reach the fundamental laws which underlie and govern all the rest. There are certain observed laws of our thoughts and our feelings, which rest upon experimental evidence, and, once seized, are a clue to the interpretation of much that we are conscious of in ourselves, and observe in one another. Such, for example, are the laws of association. Psychology, so far as it consists of such laws, is as positive and certain a science as chemistry, and fit to be taught as such."

FRANKLIN A. BECHER.

Milwaukee, Wis.

Ball-Lightning.

DURING a severe thunderstorm yesterday the phenomenon of ball-lightning was seen in this village. An inspection of the locality shows that the ball was located between a telephone wire and a conductor-pipe about three feet distant, and was doubtless of the nature of an electrical brush preceding the disruptive discharge. It was of a reddish color, and exploded with a report like a musket; but did no damage, nor was it attended by any smell perceptible to those who saw it, although they were distant not more than five feet.

M. A. VEEDER.

Lyons, N. Y., June 28.

BOOK-REVIEWS.

Animal Coloration. By FRANK E. BEDDARD. 8°. New York, Macmillan & Co.

IN the opinion of the writer the most concise and useful treatise upon the important subject of animal coloration has very recently appeared from the presses of Macmillan & Co. Its author, Mr. Frank E. Beddard, F.R.S., is especially favorably known in this country, among morphologists, through his numerous and admirable publications which have appeared in connection with his duties as prosector to the Zoological Society of London. That position, coupled with the fact that Mr. Beddard has made extensive collections of materials to illustrate his "Davis Lectures" on the subject of which his present volume treats, is ample evidence that he was peculiarly well fitted to deal with the subject. The work, a small octavo of some 300 pages, is gotten up with all that exquisite taste and style which has long ago made the house of the Macmillans so justly famous. Many excellent wood-cuts and several beautiful, colored lithographic plates illustrate its pages, they being especially devoted to giving striking examples of "protective coloration" among animals, as well as "protective mimicry," "sexual coloration," "warning coloration," "coloration as affected by environment," and numerous kindred topics. Completing the volume, we find a well-digested "General Index," and an "Index of Authors' Names." Among the latter we note those of many laborers in this country, and it is gratifying to see that America's work along such lines is upon the constant increase, and from year to year meets with enhanced favor. Our author, in his "Introductory," clearly defines the distinction between "Color" and "Coloration," the former being the actual tints which are found in animals, the latter simply referring to their arrangement or pattern. Of course, the terms become synonymous in uni-tinted animals. "The colours of animals are due either solely to the presence of definite pigments in the skin, or, in the case of transparent animals, to pigment in the tissues lying beneath the skin; or, they are partly caused by optical effects due to the scattering, diffraction, or unequal refraction of the light rays." Other matters more or less remotely bearing upon this part of the subject are briefly, though ably, dealt with, nothing of importance having been overlooked. Mr. Beddard has not remained satisfied with drawing upon any special class or group of animals for illustration, but has carried his investigations into all nature, touching in the most brilliant manner upon the significance of the colors and coloration of "deep sea forms," "cave animals," and indeed plant and animal growths from all parts of the globe. Nor has he omitted to discuss the theories of various other authorities than those advanced by himself; in short, the entire subject covered by this highly inviting field of research seems to be brought fully up to date, and in many instances the book even extends our knowledge. Biologists everywhere will thank Mr. Beddard for this contribution, and its modest price (\$3.50) will constitute no real barrier to its soon appearing upon the shelves of every working naturalist in the United States.

R. W. SHUFELDT.

Takoma, D.C.

AMONG THE PUBLISHERS.

A NEW work on astronomy, entitled in "Starry Realms," has recently come from the press of J. B. Lippincott Company. The object of the work is to give the general reader some sketches of specially interesting matters relating to the heavenly bodies. The opening chapters are devoted to the more important relations of the sun to the earth, in which the author illustrates the different functions which the sun performs. The moon's history, and the phenomena attendant upon the lunar world, the planets, the meteors, the stars, are also ably considered. The work is embellished with ten full-page illustrations, and others in the text.

— Beginning with the July number, the magazine hitherto known as *Babyhood* will bear the name of *The Mother's Nursery Guide*, which expresses its purpose more fully and clearly than did the old appellation. There is no other change discernable in the essential features of the magazine, which looks back upon a

prosperous past of nearly eight years. The July number contains a summary, by the medical editor, of the present status of the question of milk sterilization, concerning the value of which the last word has not yet been said. "Baby's Flannels" forms the subject of another medical paper.

— The new edition of "Chambers's Encyclopædia" is rapidly nearing completion, and with the advent of one more volume this standard reference book will be at the command of all who are desirous of procuring a most accurate, convenient, and useful encyclopædia. The ninth volume has just been issued. Among the more important American articles are found San Francisco, St. Louis, St. Paul, Scandinavian Mythology, Sir Walter Scott, Sewage, Sewing Machine, Shakers, Shakespeare, Shelley, Phil. Sheridan, Sherman, Ship-Building, Silk, Silver, Slang, Soda, South Carolina, Spain, Sugar, Spiritualism, etc. These are all copyrighted, as are also the articles by American authors in all the volumes issued. The maps of this number include Russia, Scotland, South Australia, Spain, and South Carolina, prepared according to the latest geographical surveys. "Chambers's Encyclopædia" is never disappointing, its articles are well up to date, and a large number of entirely new subjects are introduced. The illustrations are incomparably the best ever issued in a work of this character. The volumes contain on an average nearly a thousand pages each. Volume X. will be issued in the fall. J. B. Lippincott Company are the American publishers.

— Messrs. Joseph Baer & Co., booksellers, Frankfort, are selling the botanical library of the late Professor L. Just, director of the botanical garden connected with the Polytechnicum at Carlsruhe. The list includes many important works in various departments of botanical science.

— In 1874 the British Association published a volume of "Notes and Queries on Anthropology," the object being to promote accurate anthropological observation on the part of travellers, and to enable those who were not anthropologists themselves to supply information wanted for the scientific study of anthropology at home. A second edition has long been wanted and a committee was appointed by the British Association to consider and report on the best means for bringing the volume up to the requirements of the present time. The committee recommended that the work should be transferred to the Anthropological Institute, and this proposal was accepted, the Association making grants amounting to £70 to aid in defraying the cost of publication. The new edition has now been issued, according to *Nature*, the editors being Dr. J. G. Garson and Mr. C. H. Read; and everyone who may have occasion to use it will find it thorough and most suggestive. The first part—Anthropography—has been entirely recast; the second part—Ethnography—has been revised, and additional chapters have been written. Among the contributors to the volume are Mr. F. Galton, Mr. A. W. Franks, Dr. E. B. Tylor, General Pitt-Rivers, and many other well-known authorities.

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For information address Mr. FRITZ RUHL, President of the Societas Entomologica, Zurich-Hottingen, Switzerland.

NEO-DARWINISM AND NEO-LAMARCKISM.

By LESTER F. WARD.

Annual address of the President of the Biological Society of Washington delivered Jan. 24, 1891. A historical and critical review of modern scientific thought relative to heredity, and especially to the problem of the transmission of acquired characters. The following are the several heads involved in the discussion: Status of the Problem, Lamarckism, Darwinism, Acquired Characters, Theories of Heredity, Views of Mr. Galton, Teachings of Professor Weismann, A Critique of Weismann, Neo-Darwinism, Neo-Lamarckism, the American "School," Application to the Human Race. In so far as views are expressed they are in the main in line with the general current of American thought, and opposed to the extreme doctrine of the non-transmissibility of acquired characters.

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For exchange.—Three copies of "American State Papers (bearing on Sunday Legislation)," 1801, 82, 5, 10, 11, and 12, and unused, for "The Sabbath," by H. A. Paches, 1842, 1840; "The Sabbath," by A. A. Paches, 1842; "History of the Institution of the Sabbath, Day, Its Uses and Abuses," by W. L. Fisher, 1839; "Humorous Phases of the Law," by Irving Browner; or other works amounting to value of books exchanged, on the question of governmental legislation in reference to religion, personal liberty, etc. If preferred, I will sell "American State Papers," and buy other books on the subject. WILLIAM ADDISON BLAKELY, Chicago, Ill.

For Sale or Exchange for books a complete, private chemical laboratory outfit. Includes large Becker balance (200g. to 1-10mg.), platinum dishes and crucibles, agate mortars, glass-blowing apparatus, etc. For sale in part or whole. Also complete set of "Smithsonian Reports," 1862-1883 (62-71 bound); Smithsonian Reports, 1854-1883; U. S. Coast Survey, 1854-1860. Full particulars to enquirers. F. GARDINER, JR., Pomfret, Conn.

Wanted, in exchange for the following works, any standard works on Surgery and on Diseases of Children: Wilson's "American Ornithology," 3 vols.; Coues' "Birds of the Northwest" and "Birds of the Colorado Valley," 2 vols.; Minot's "Land and Game Birds of New England"; Samuels' "Our Northern and Eastern Birds," all the Reports on the Birds of the Pacific R. R. Survey, bound in 2 vols., Morocco; and a complete set of the Reports of the Arkansas Geological Survey. Please give editions and dates in corresponding. R. ELLSWORTH CALL, High School, Des Moines, Iowa.

To exchange Wright's "Ice Age in North America" and Le Conte's "Elements of Geology" (Copyright 1882) for "Darwinism," by A. R. Wallace, "Origin of Species," by Darwin, "Descent of Man," by Darwin, "Man's Place in Nature," Huxley, "Mental Evolution in Animals," by Romanes, "Pre-Adamites," by Winchell. No books wanted except latest editions, and books in good condition. C. S. Brown, Jr., Vanderbilt University, Nashville, Tenn.

Wants.

Any person seeking a position for which he is qualified by his scientific attainments, or any person seeking some one to fill a position of this character, be it that of a teacher of science, chemist, draughtsman, or what not, may have the "Want" inserted under this head FREE OF COST, if he satisfies the publisher of the suitable character of his application. Any person seeking information on any scientific question, the address of any scientific man, or who can in any way use this column for a purpose consonant with the nature of the paper, is cordially invited to do so.

WANTED.—The services of a wide-awake young man, as correspondent, in a large manufacturing optical business; one preferred who has a thorough knowledge of microscopy and some knowledge of photography. Address by letter, stating age and references. Optical, care of Science, 874 Broadway, New York.

WANTED.—We want any and all of the following, providing we can trade other books and magazines or buy them cheap for cash: Academy, London, vol. 1 to 28, 35, Jan. and Feb., '89; Age of Steel, vol. 1 to 66; American Antiquarian, vol. 1, 2; American Architect, vol. 1 to 6, 9; American Art Review, vol. 3; American Field, vol. 1 to 21; American Geologist, vol. 1 to 6; American Machinist, vol. 1 to 4; Art Amateur, vol. 1 to 7, Oct., '41; Art Interchange, vol. 1 to 9; Art Union, vol. 1 to 4, Jan., '44, July, '45; Bibliotheca Sacra, vol. 1 to 46; Godey's Lady's Book, vol. 1 to 20; New Englander, vol. 11; Zoologist, Series 1 and 1, Series 3 vol. 1 to 14; Allen Ardenale (a novel), Rayner's "Old Book" Store, 243 4th Ave. S. Minneapolis, Minn.

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WANTED.—To act as correspondent for one or two daily or weekly papers. Have worked on paper for about two years. Would like a position on editorial staff of humorous paper. Address GEO. C. MASON, 14 Elm St., Hartford, Conn.

TRANSLATOR wanted to read German architectural works at sight (no writing). One familiar with technical terms desired. Address "A," Box 149, New York Post Office.

WANTED.—A position in a manufacturing establishment by a manufacturing Chemist of inventive ability. Address M. W. B., care of Science, 874 Broadway, N. Y.

WANTED.—Books on Anatomy and Hypnotism. Will pay cash or give similar books in exchange. Also want medical battery and photo outfit. DR. ANDERSON, 182 State street, Chicago, Ill.

—The Open Court Publishing Co., Chicago, has just ready a second edition, revised and enlarged, of Gen. M. Trumbull's timely book on the tariff question, "The Free-Trade Struggle in England."

—Charles L. Webster & Co. announce that they will issue in book form Mr. Poultney Bigelow's Danube articles describing his canoe voyage down that river, the title of the book being "Paddles and Politics Down the Danube."

—In *Lippincott's Magazine* for July "Peary's North Greenland Expedition and the Relief" is well and interestingly covered by W. E. Hughes and Benjamin Sharp. Gertrude Atherton contributes a short essay on "Geographical Fiction."

—Charles H. Sergel & Co., Chicago, have just issued in their series of Latin-American Republics "A History of Peru," by Clements R. Markham, which gives a complete history of the country from the conquest to the present time. They have in press for the same series "A History of Chile," by Anson Uriel Hancock; and in active preparation "A History of Brazil," by

William Eleroy Curtis; "A History of Argentine," by Mary Aplin Sprague; and "A History of Bolivia," by T. H. Anderson, U. S. Minister to Bolivia.

—Macmillan & Co. have just ready "The Barren Ground of Northern Canada," by Warburton Pike, with maps.

—Chain & Hardy Co., Denver, Col., have just ready a little pamphlet, entitled "Review of Ore Deposits in Various Countries," by Rudolf Keck, of Colorado Springs, Col.

—G. P. Putnam's Sons have just ready an important work on "The English Language and English Grammar, being an historical study of the sources, development and analogies of the language and of the principles governing its usages, illustrated by copious examples from writers of all periods," by Samuel Ramsey; the fifth and concluding volume of the "Memoirs of Talleyrand;" "Earth-Burial and Cremation," a history of earth-burial with its attendant evils, and the advantages offered by cremation, by Augustus G. Cobb, formerly President of the U. S. Cremation Society and Vice-President of the New York Cremation Society.

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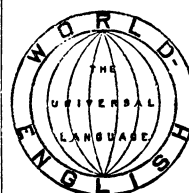
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